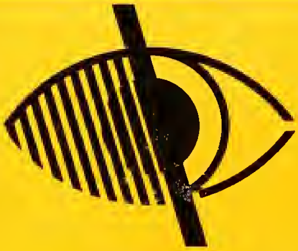
Lighting and low vision

HV 5568
L 626



Introduced during the 1981 International Year of Disabled People, the motif shown on the cover is the new access and recognition symbol for visual disability. It can be displayed on shops, restaurants and other public buildings known to be safely accessible by visually impaired people, and can be used to draw attention to any source of information provided for them. When displayed in the form of a lapel badge, the symbol denotes that the wearer has difficulty in seeing, a fact that may not otherwise be readily apparent.

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Lighting and low vision

It is estimated that at least 250,000 people in this country suffer from substantially limited vision and many more have some difficulty in reading. Some of these people can lead a normal life with the help of conventional optical aids such as spectacles. However, there is a large group of people who cannot be helped adequately by conventional means, but who might benefit from high powered optical aids, clear print, strong colour contrasts and efficient lighting. Most of the people in this group will be elderly, and may have additional problems such as arthritis. This makes it particularly important that they be helped to make the maximum use of sight to work and to move about in danger areas like kitchens and on staircases.

Many aids to vision have been investigated and developed but the particular benefits that efficient lighting can give are not widely appreciated by field workers in the Health and Social Services, or by people who have limited vision. One reason for this is the misconception about ‘sight-saving’ which discourages them from making full use of the vision they have. Within the same broad limits that apply to normal sight, using impaired vision can do no harm whatsoever.

This booklet draws attention to ways in which the environment can aid vision and explores some of the special lighting needs of people with limited vision.

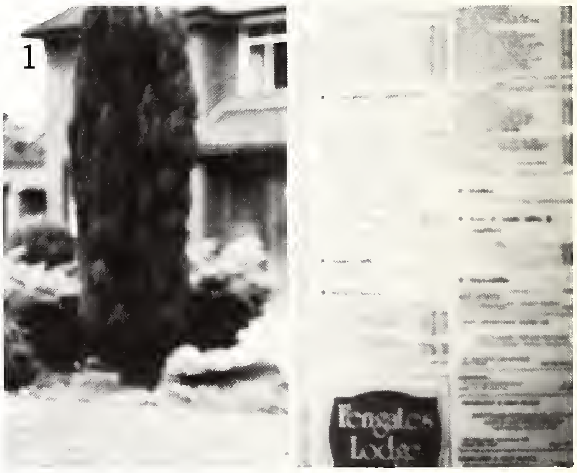
Limited vision

Although partial loss of vision can be caused by many different clinical conditions, the actual loss takes one, or both, of two forms. The first is blurred vision (loss of visual acuity) in which any object seen is indistinct and its outlines unclear. The extent of the blurring will vary from person to person, and some may have to bring objects and print extremely close to their eyes to see best. This cannot harm the eyes in any way. There may also be an associated loss of colour vision.

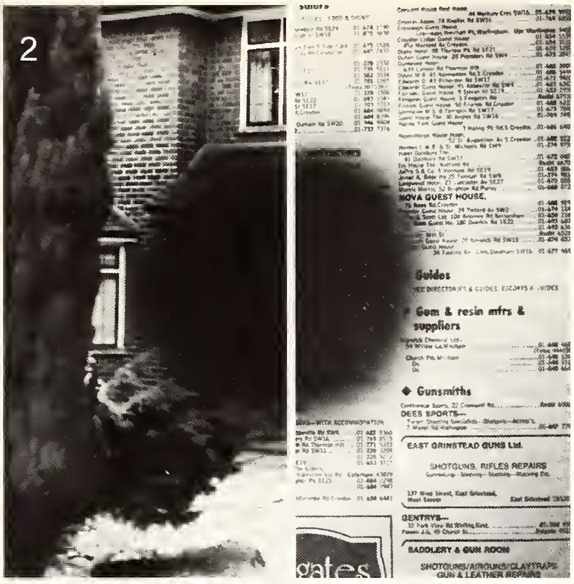
The second type of loss is in the field of vision. One or more parts of the whole picture may be blurred or missing altogether, either in the middle or around the edges. There may be a blind spot in the centre of the field of view, the part responsible for seeing fine detail; or some or all of the periphery may be affected. When most of the periphery is missing, the result is a form of ‘tunnel vision’. Alternatively, only a portion may be affected, resulting in a loss of vision in patches, or in one half of the visual field.

So, even when causes are similar, the particular difficulties which people with limited vision experience, and their responses to light and other environmental features, may be quite different. Cataract, for example, is a progressive cloudiness of the lens inside the eye which will differ in its effects depending on its size and position within the lens. Intense lighting may or may not be helpful. If the cataract is located centrally, an excessively high level of lighting will close the pupil to the extent that the cataract will prevent light entering the eye. Although relatively uncommon, there are also other specific eye conditions where the need is for less, not more, light.

It is therefore important to be flexible and take a trial and error approach when seeking a solution for the individual. It is also important that medical advice be sought if there is any reason to be concerned about an eye condition, or if there are any unexpected changes in the amount that can be seen.



Substantially lowered acuity, but no loss of field of vision. Most everyday visual activities would present severe difficulty. Note that there is some improvement for this person when objects are viewed at very close range, and/or in large print.



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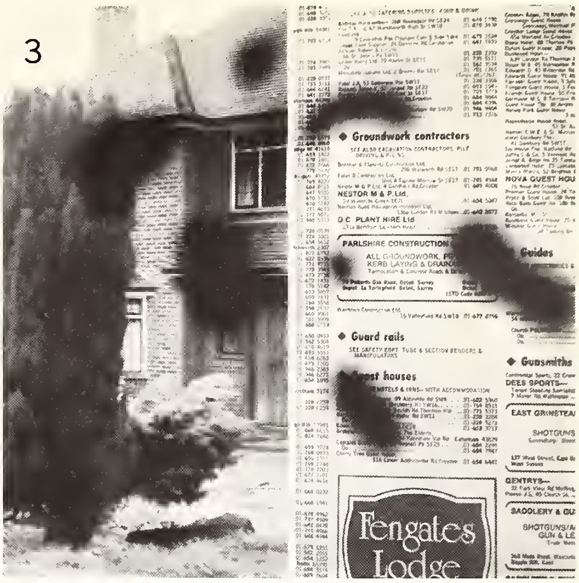
Loss of central vision, typical of macular degeneration – a common cause of visual impairment in the elderly. Although this person would be able to see to move about in relative safety, reading, sewing and other detailed work would be very difficult, if not impossible.



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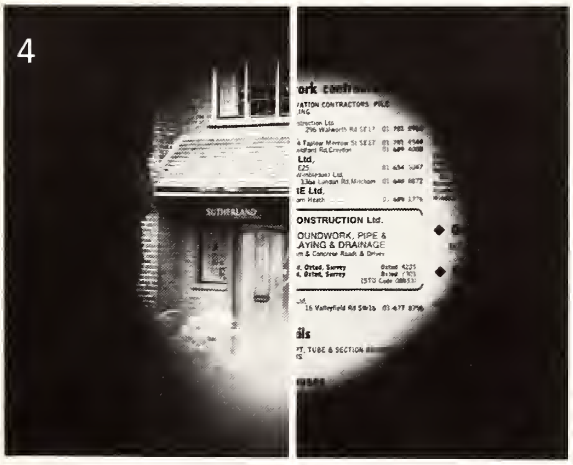
A patchy loss of vision, often resulting from diabetes, combined here with a slight loss of acuity. In individual cases, the exact nature and extent of the visual disability depends on the number, size and relative positions of the patches which can vary from time to time.



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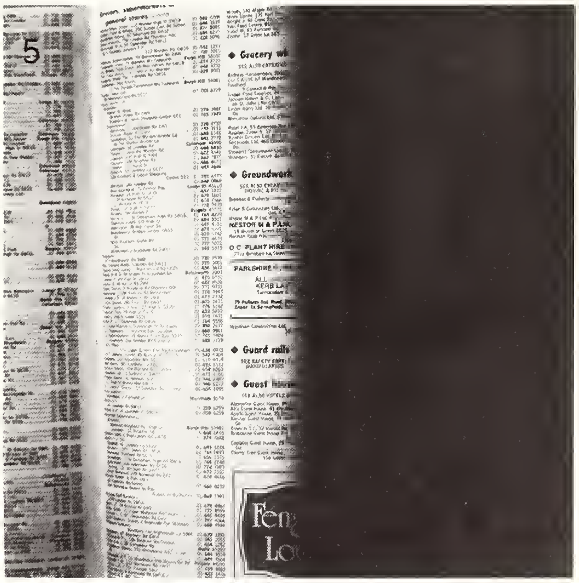
The converse of 2., severe tunnel vision with, in this case, perfect central acuity. This might result from advanced glaucoma or some forms of retinitis pigmentosa. Mobility would be impaired because of the loss of peripheral vision, whilst reading and other fine work would remain largely unaffected. Note that large print would not be helpful in this case.



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Loss of one half of the visual field can variously involve either the left or right-side, or the upper or lower portion. Shown here is right sided loss. Because we read from left to right, reading ability would be disrupted. Mobility would also be seriously affected.

Basics

The basic requirement is to get enough, but not too much, light where it's needed, without glare and with a correct distribution of light from area to area.

Flexibility is needed. not only because people's requirements differ, but also because visual tasks themselves vary. Visual tasks differ in a number of critical ways, but are generally of two types: close or detailed work (eg reading, sewing), and seeing at a distance (eg moving about). Good lighting takes account of these differences by providing both local lighting for close work and general lighting for background and general purpose illumination.

In the home, local lighting is usually provided by table and standard lamps; general lighting by ceiling pendants and/or wall lamps. It is important not to try to light detailed tasks by a ceiling mounted lighting fitting alone.

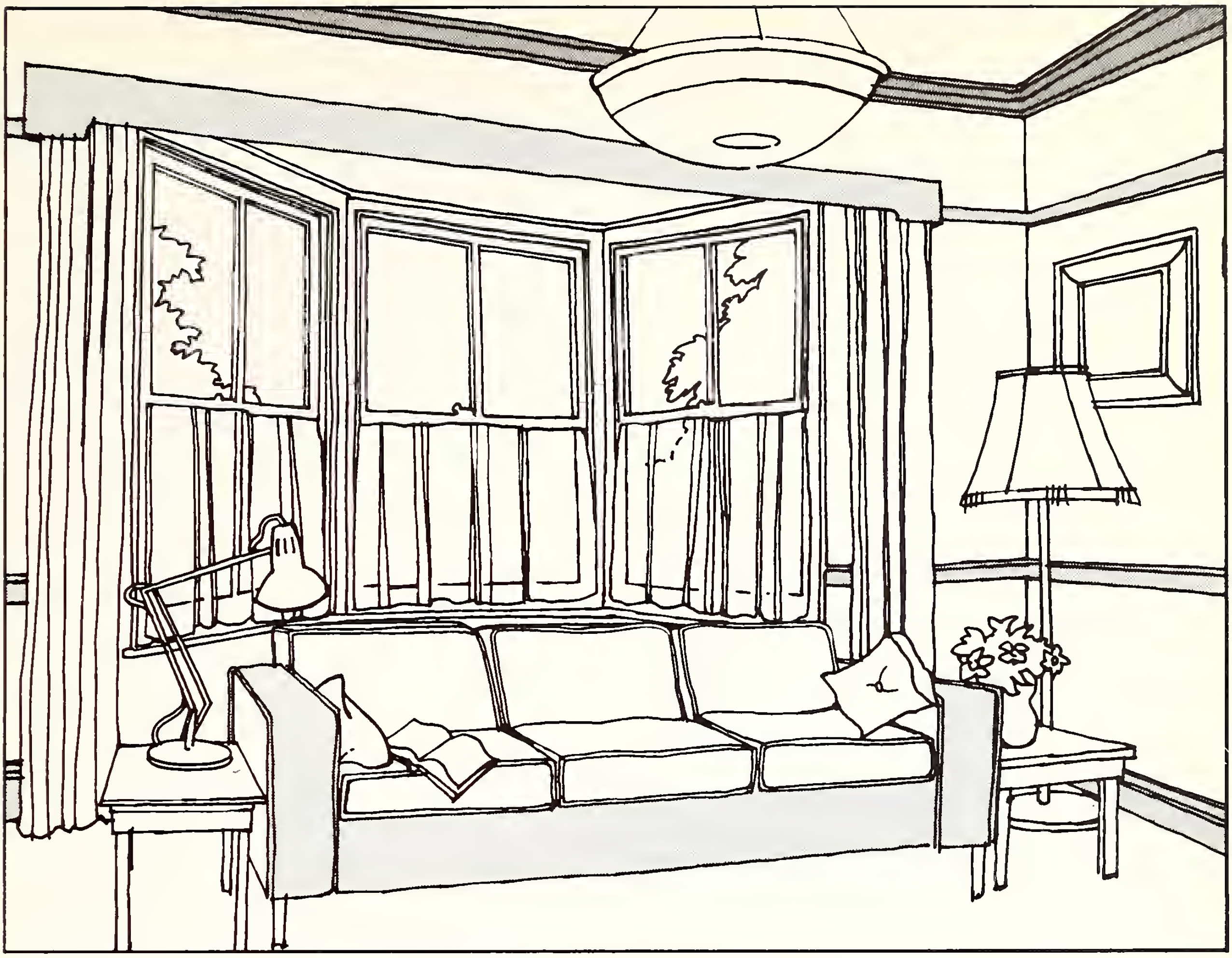
As well as getting the correct amount of light on the task in hand, it is also important to ensure that light levels from room to room and from one area to the next in the same room are not too uneven. For example, reading by a desk lamp, or watching television, with the rest of the room in darkness is to be avoided. Similarly, after doing close work in a bright light, moving into a dimly lit area will be dangerous because the eyes will have become adapted to a higher light level and it will take some time to become accustomed to the lower lighting level.

Particular attention should be given to danger areas such as stairs and landings which are often inadequately lit in comparison to the rooms opening onto them.

It is also important to remember that most of the light that enters our eyes has not come direct from its source but has been reflected from the ceiling and walls and from objects in the room. Decor and colour schemes consequently have an enormous contribution to make to the amount of light available in an interior.

Daylighting and decor

Daylight is an important source of light which is frequently wasted. The first requirement is that curtains should draw well clear of the window so as not to obstruct the light. If daytime privacy is required only the very lightest net curtain should be used. For the same reason, window frames and glazing bars should be light in colour. It is important that windows, like spectacles, should be kept clean to transmit the greatest amount of light.

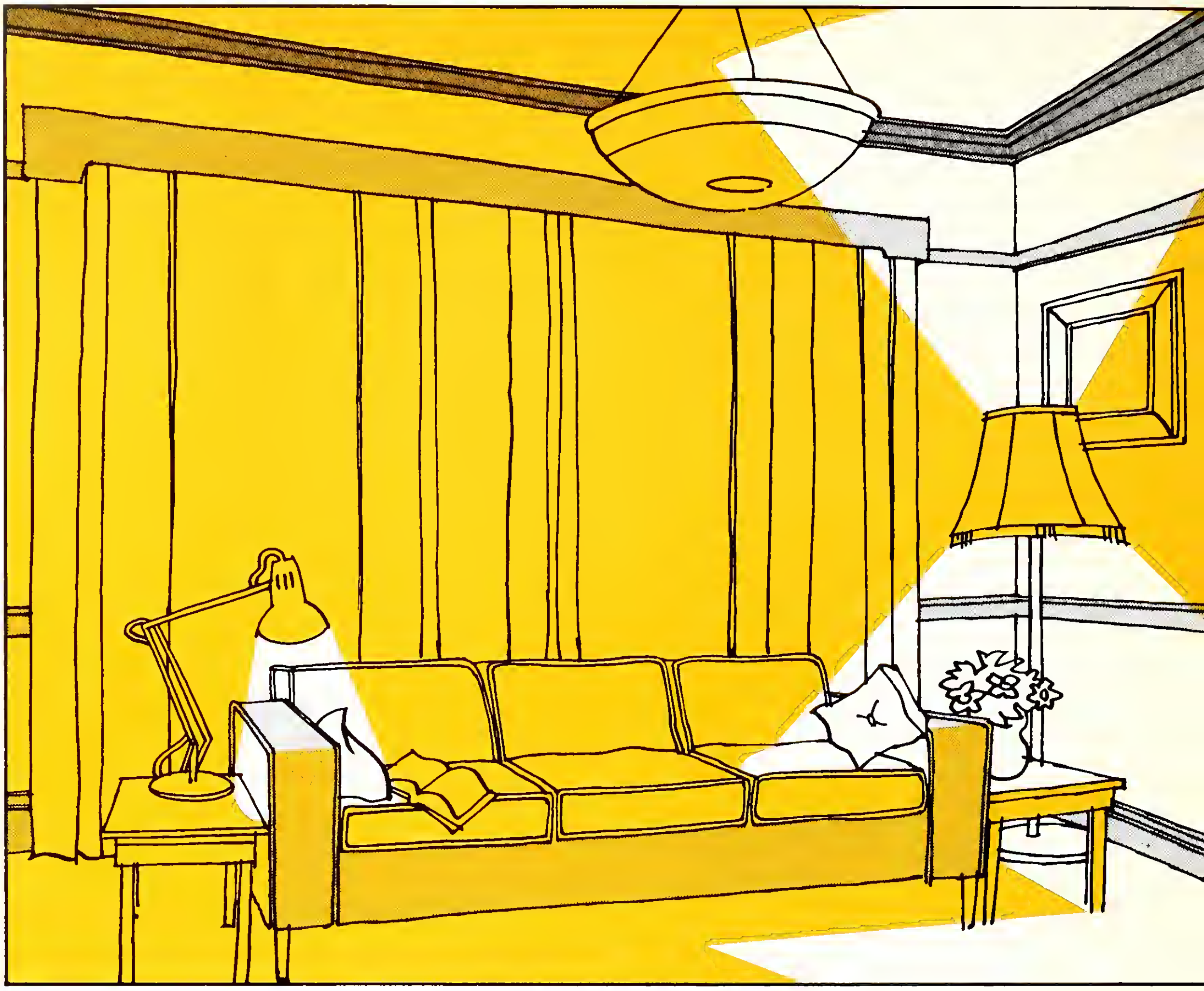


It is also an advantage if the furniture can be arranged so that light from the windows provides maximum benefit, eg by falling on the task from over the shoulder. Table lamps or floor standards should then be positioned to serve this furniture layout or, if the electric light is fixed (ie a ceiling pendant or wall brackets), an alternative reading position should be used when daylight is no longer adequate.

In the main, decoration of walls and ceiling should be in light colours. These will then reflect more light into the room and aid seeing by contrasting with furniture and other objects. Too bland a colour scheme, however, may make orientation difficult. Regular spring cleaning and re-decoration will ensure that the light reflected continues to be at a maximum.

Safe movement is aided if the individual appreciates exactly where he is at any time. Orientation can be aided aurally as well as visually. A loud ticking clock can be an aural focus while the use of bright or contrasting colours for certain surfaces or objects can provide a visual clue.

Doors and door surrounds,



handles, switches, plugs and sockets, crockery, etc can all be made more conspicuous by being in contrasting colours to their immediate background.

Electric lighting

The first thing that must be said is that artificial light is not harmful to the eyes and no amount of use in such light will harm them. Many people misguidedly refuse to read small print in case they 'strain' or even damage their eyes. Careless positioning of the light source may lead to glare, and inadequate lighting makes reading difficult, but while both of these can lead to headaches and a feeling of eyestrain the effects are largely muscular and temporary and can do no permanent harm.

The most common reasons for difficulty in seeing to read are:

1. inadequate light levels
2. shadows cast by poorly positioned lamps
3. glare from naked or inadequately shielded lamps
4. unsuitable, or sometimes merely dirty, spectacles

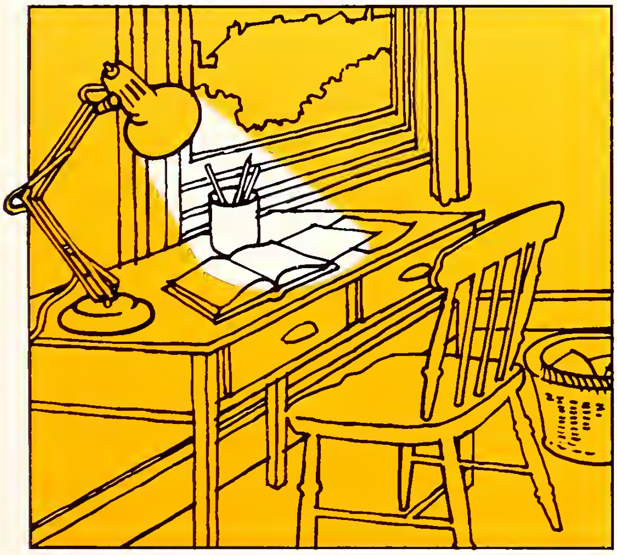
Quantity of light

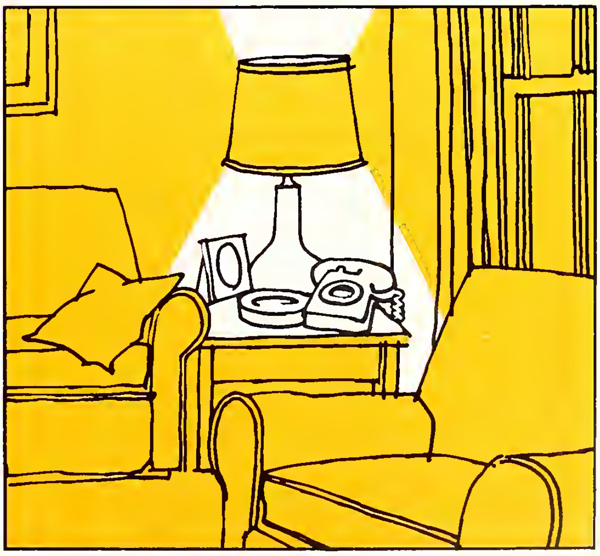
The amount of light needed for best vision will vary between individuals. Although most elderly and partially sighted people need relatively high light levels, remember that a few may benefit from less light.

For trial and error purposes, a good starting point is to use a local light with a 100W lamp – perhaps an adjustable reading lamp if one is available, or a table lamp with a shade about 10 to 12 inches in diameter and a white interior. The reading lamp has the advantage that it can be positioned to illuminate the task without causing glare and can provide a very high level of light when required. It should not, however, be placed where it can be knocked when turning or so close that its heat is uncomfortable.

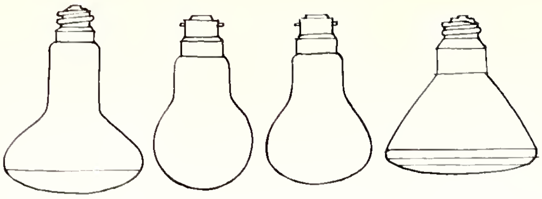
If enough light cannot be provided without placing the lamp very close to the task do not try substituting a larger lamp unless the fitting is clearly marked as being able to take it. A possible solution is to use an internally silvered spot lamp which will direct the light more effectively and enable the lamp to be further away from the task.

The main disadvantage of a reading lamp is that, because it lights only the task area and leaves the rest of the room in darkness, additional lighting is always necessary. A table lamp permits upward light to be reflected from the walls and ceiling to brighten the room in general. Its disadvantage is that the pool of light beneath cannot be easily adjusted for the particular task and individual. A white lined shade will ensure that the maximum amount of light is reflected. Using as big a diameter shade as possible will obstruct the minimum amount of light (but not too large or the lamp will become unstable).

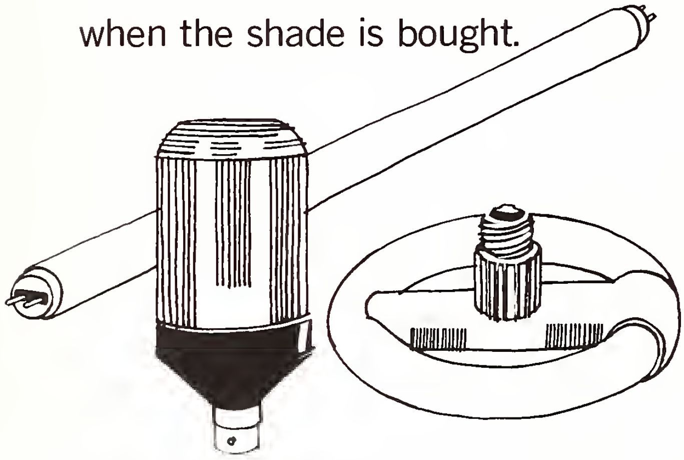




Lamps



The ordinary incandescent filament lamp is widely available in 25, 40, 60, 75, 100 and 150 Watt ratings, and may be in a clear, frosted (pearl) or diffusing (white) finish. Clear lamps give the most light but can be a source of glare if used in an unsuitable shade. The frosted and the diffusing lamps give softer shadows with only a small loss of light output. Most domestic shades are suitable for use with lamps up to 100W but this should be checked when the shade is bought.



Fluorescent lamps are much more expensive to buy because they need special fittings incorporating control gear. Once purchased, however, they are cheap to use because the lamp lasts up to eight times as long and gives about five times as much light as the same wattage of filament lamps (ie for the same amount of light, a fluorescent lamp is five times cheaper to run).

The most useful sizes are the 4ft 40W and 5ft 65W although others, both longer and shorter, are available. A wide range of colours of lamp is available and the better colour rendering types (eg warm white de luxe) are to be preferred, although they may have to be used in two, or more, lamp fittings to obtain enough general illumination.

Light fittings

The choice will obviously depend upon personal preference but it should be borne in mind that the most decorative is seldom the most functional. The following points are offered as guidance.

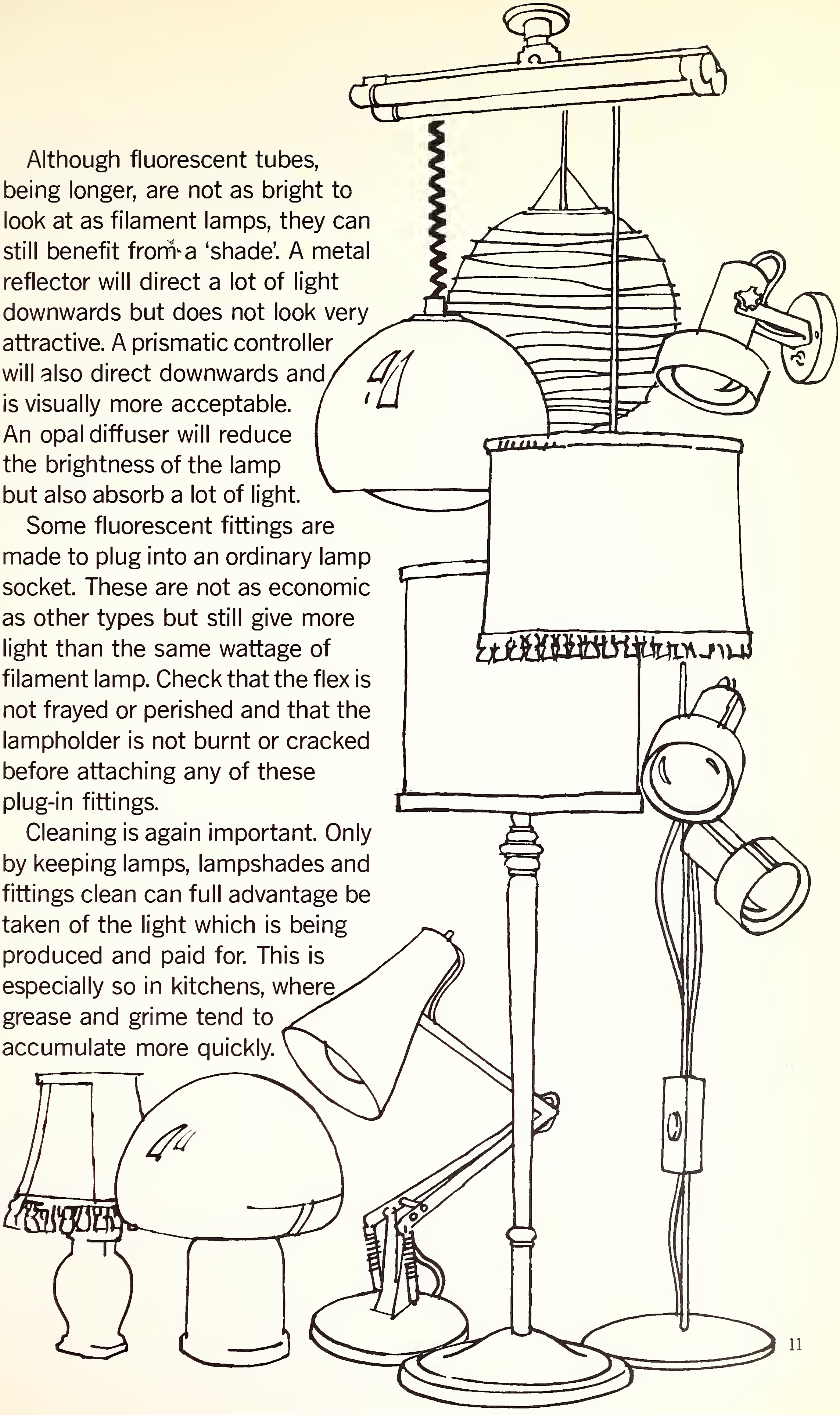
Lampshades should have white linings to reflect the maximum amount of light. Coloured shades can give unwanted colour casts. Big is best; a large shade will not only obstruct less light but also cope better than a small one with the heat from the lamp. In the case of pendant fittings, shades which are open, or at least translucent, at the top will allow light to reflect off the ceiling.

Adjustable lamps should be capable of being adjusted without burning the fingers and should be capable of staying where placed without sagging. They should also be stable and this usually means a wide or heavy base.

Although fluorescent tubes, being longer, are not as bright to look at as filament lamps, they can still benefit from a 'shade'. A metal reflector will direct a lot of light downwards but does not look very attractive. A prismatic controller will also direct downwards and is visually more acceptable. An opal diffuser will reduce the brightness of the lamp but also absorb a lot of light.

Some fluorescent fittings are made to plug into an ordinary lamp socket. These are not as economic as other types but still give more light than the same wattage of filament lamp. Check that the flex is not frayed or perished and that the lampholder is not burnt or cracked before attaching any of these plug-in fittings.

Cleaning is again important. Only by keeping lamps, lampshades and fittings clean can full advantage be taken of the light which is being produced and paid for. This is especially so in kitchens, where grease and grime tend to accumulate more quickly.



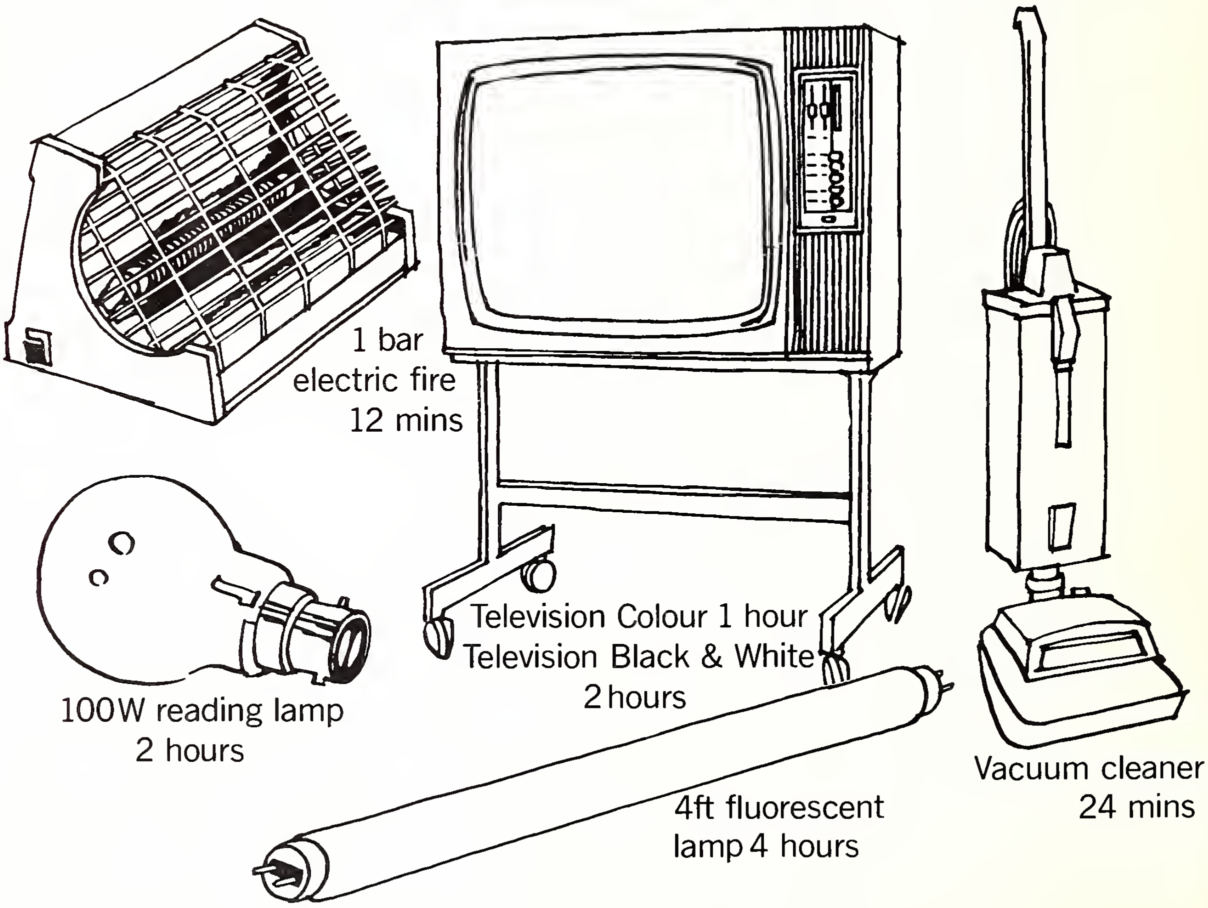
Costs

Although putting the light close to the task (or vice-versa) is the most efficient method of lighting, table lamps and floor standards are often considered expensive both to buy and to run and people are discouraged from using electric light during the day to supplement daylight. However, whereas the cost of the fitting may be regarded as an investment, the running cost will simply be proportional to the wattage of the lamp used.

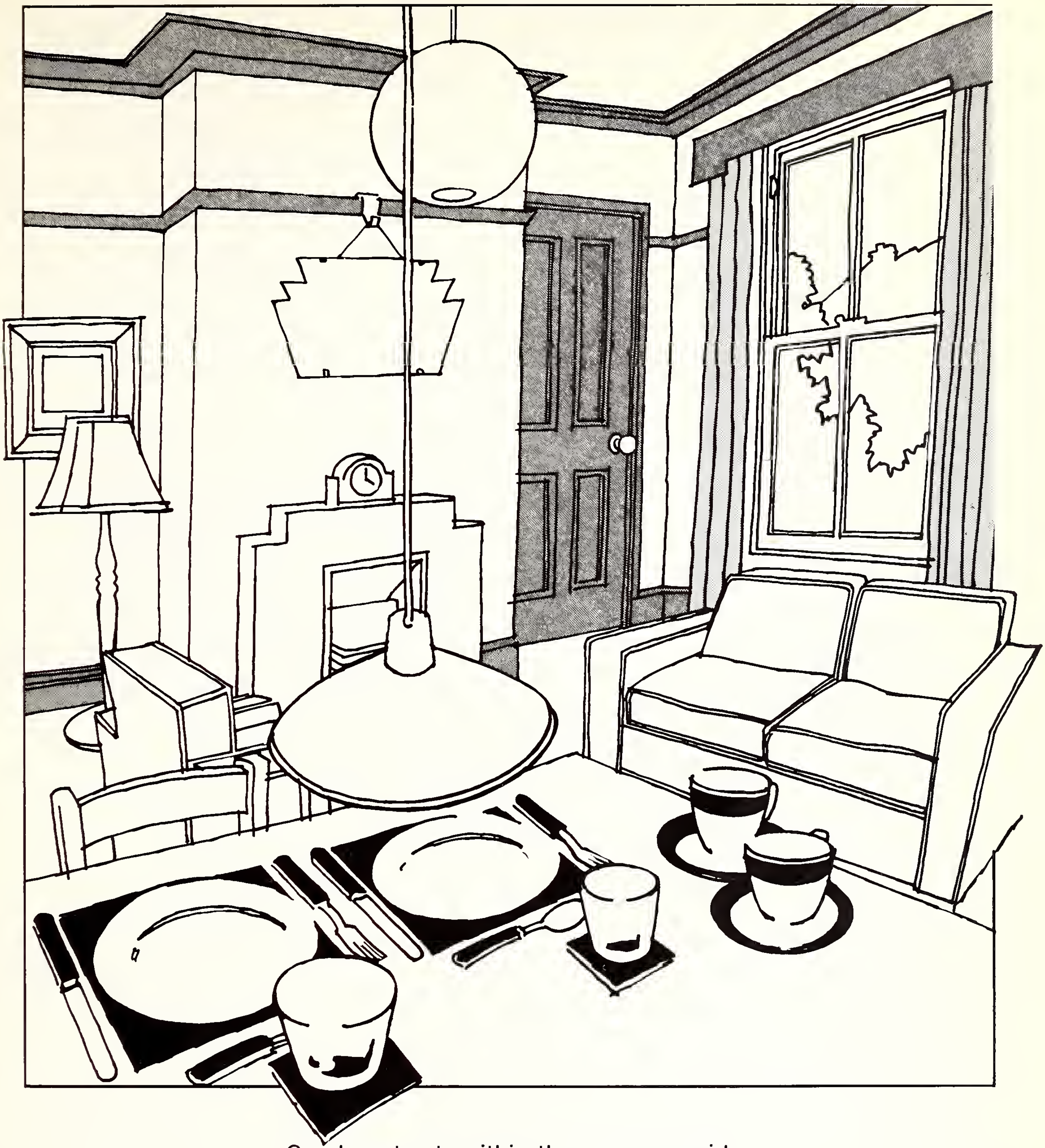
The table below shows the number of hours of use that can be obtained for one unit of electricity which at present costs about 5p (the exact cost is shown on your electricity bill)

Lamp Wattage Filament	Lamp Wattage Fluorescent	Hours per Unit	Approx hours per 1p
40	–	25	5
–	40	20	4
60	–	16.7	3¼
–	65	12.5	2½
75	–	13.3	2¾
100	–	10	2
150	–	6.7	1¼

The hours you get for 1p. using these appliances:

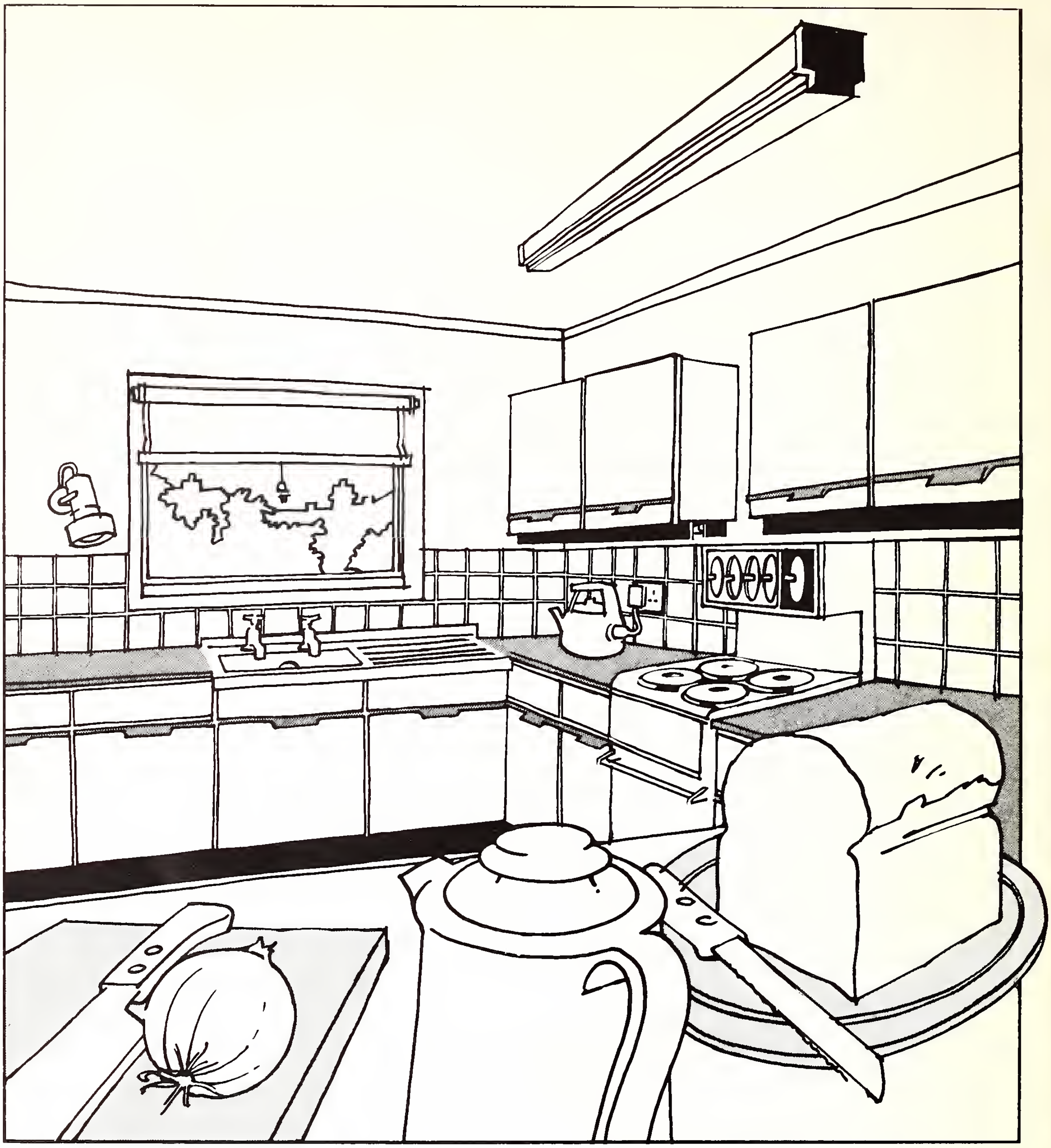

1 bar electric fire 12 mins
Television Colour 1 hour
Television Black & White 2 hours
100W reading lamp 2 hours
4ft fluorescent lamp 4 hours
Vacuum cleaner 24 mins

Living room



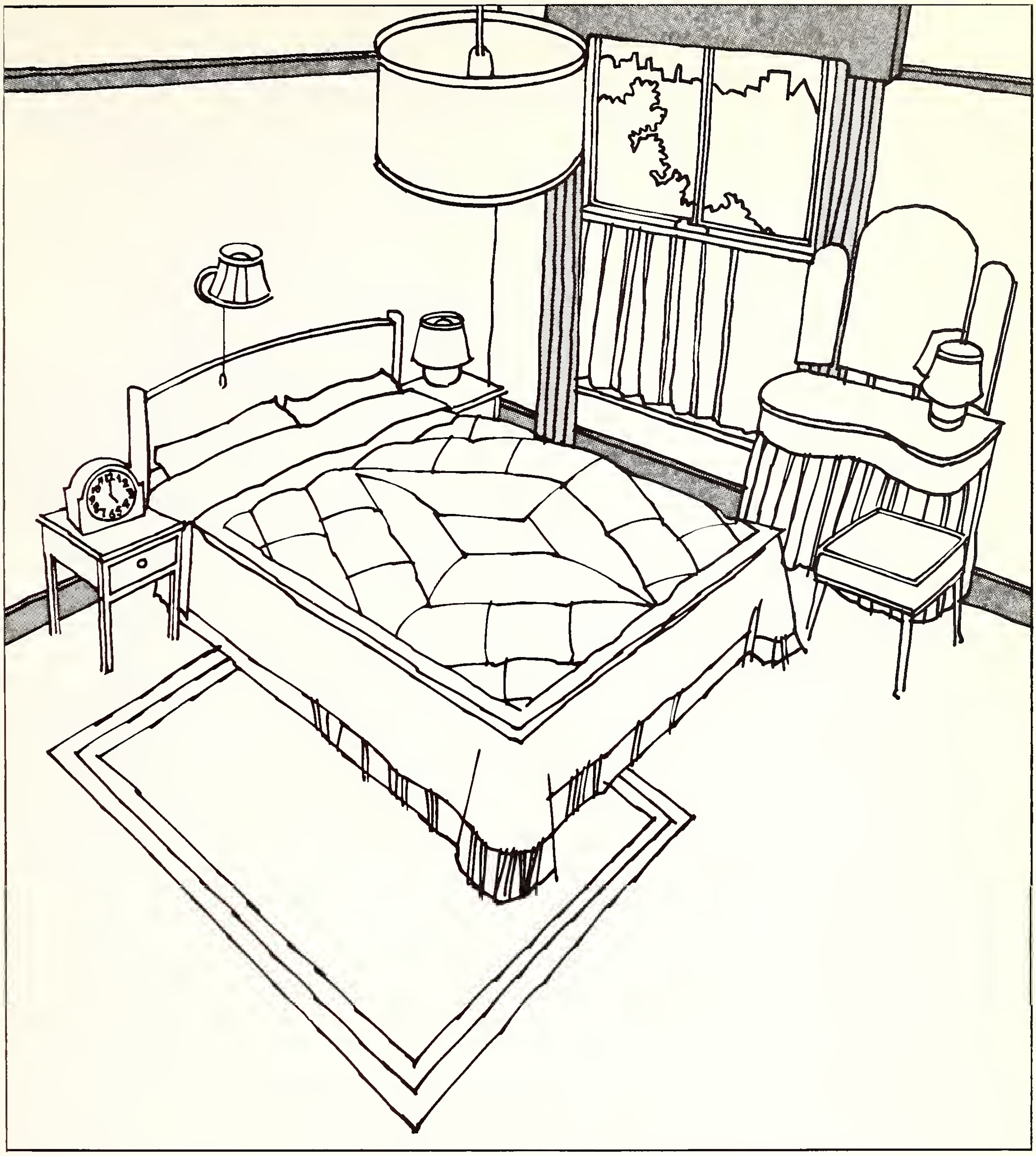
Good contrasts within the room can aid orientation and make furniture, doors, etc easier to locate. On the table, contrast between cutlery, crockery and the table top can be provided by choice of colours or by the use of contrasting place mats.

Kitchen



A fluorescent light on the ceiling will give good general lighting and smaller fluorescent lamps under the wall cupboards can light work tops. Having an area of dark and an area of light coloured work top enables a choice to be made to suit the task in hand. Alternatively, the use of a double-sided chopping or bread board with one side dark and the other light may make a practical substitute.

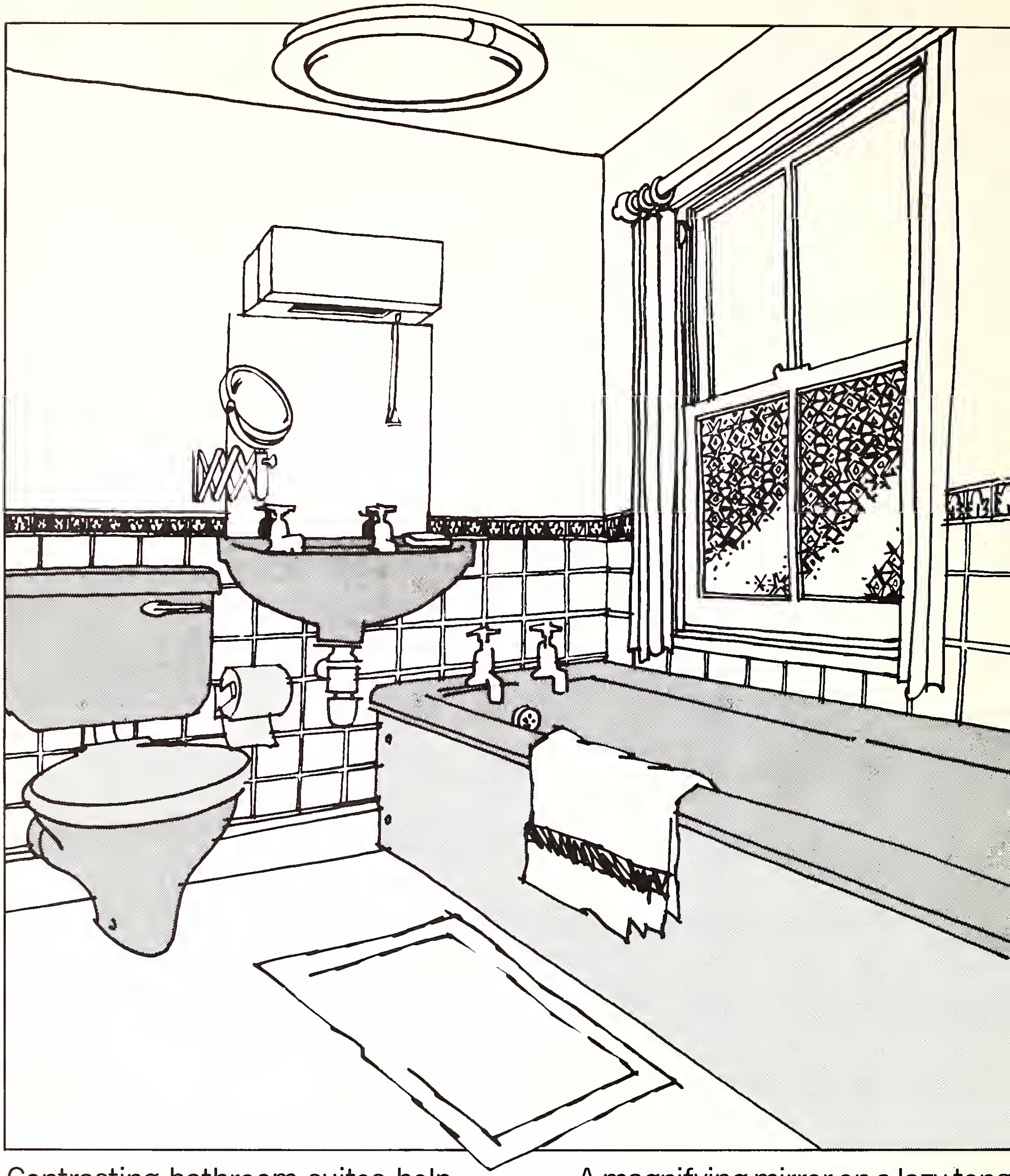
Bedroom



A large drum shade will permit upward light to brighten the room. Mounting a 'bed-side' lamp on the wall prevents it from being knocked over and leaves room on the bed-side table.

The dressing table is sited to make use of daylight.

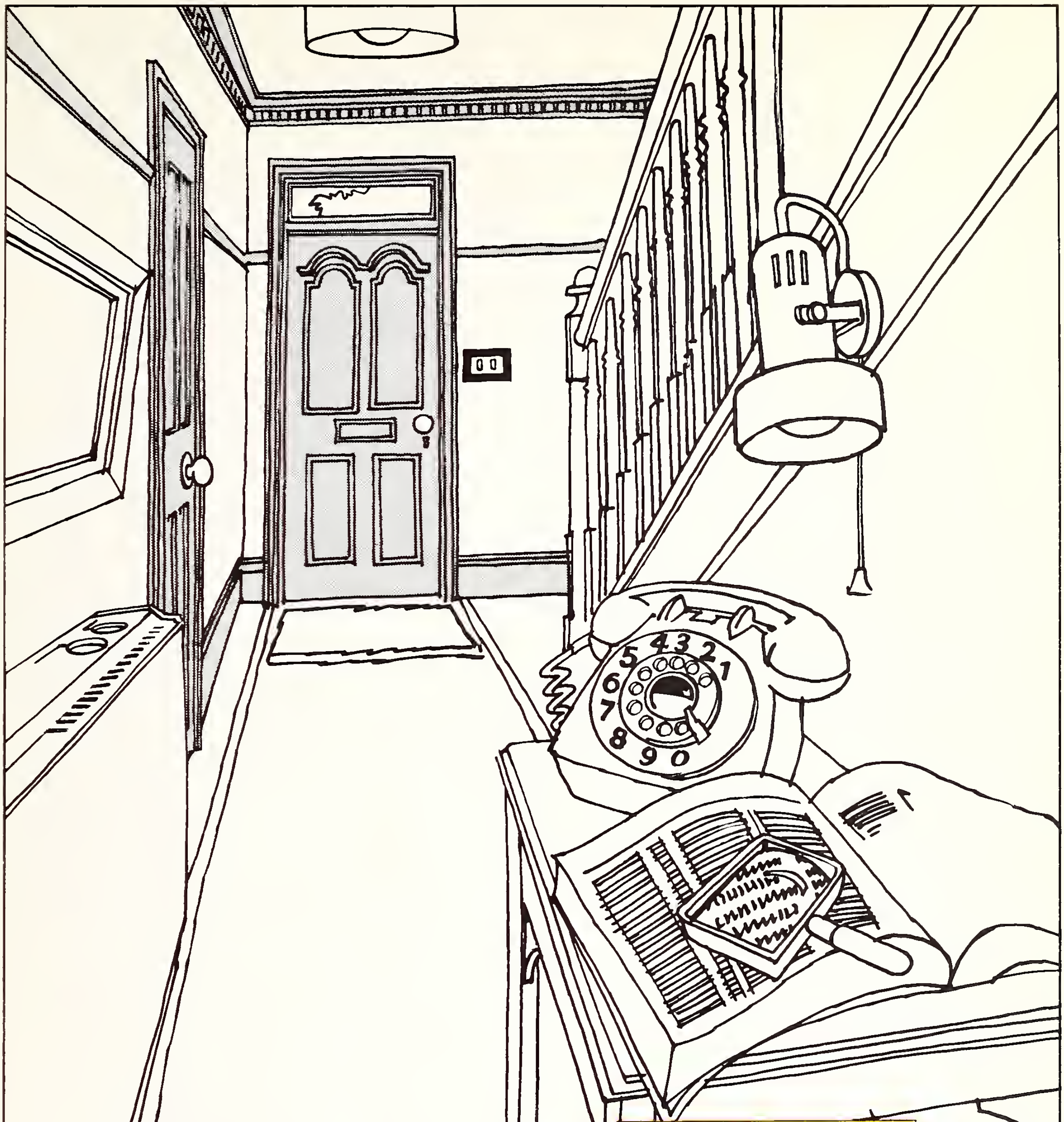
Bathroom



Contrasting bathroom suites help exact location. The mirror-mounted light combined with a fan heater keeps the mirror clear of steam and heats the bathroom in safety.

A magnifying mirror on a lazy tong arm helps shaving and applying make-up. A dark wall opposite the mirror (or a dark towel on a rail) may help some to use the mirror.

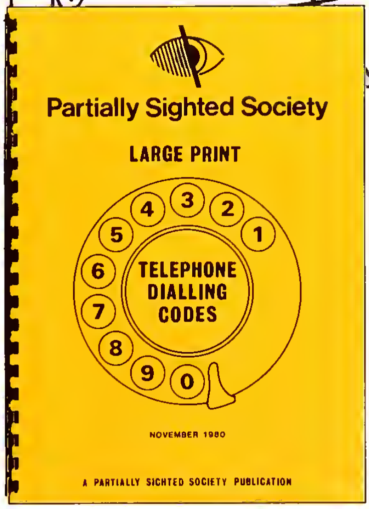
Hall



In the hall a spotlight over the phone helps to find numbers and dial correctly.

Contrast is used to aid location although some care should be taken to avoid it becoming garish.

A large drum shade is used to get the maximum amount of light.



Partially Sighted Society

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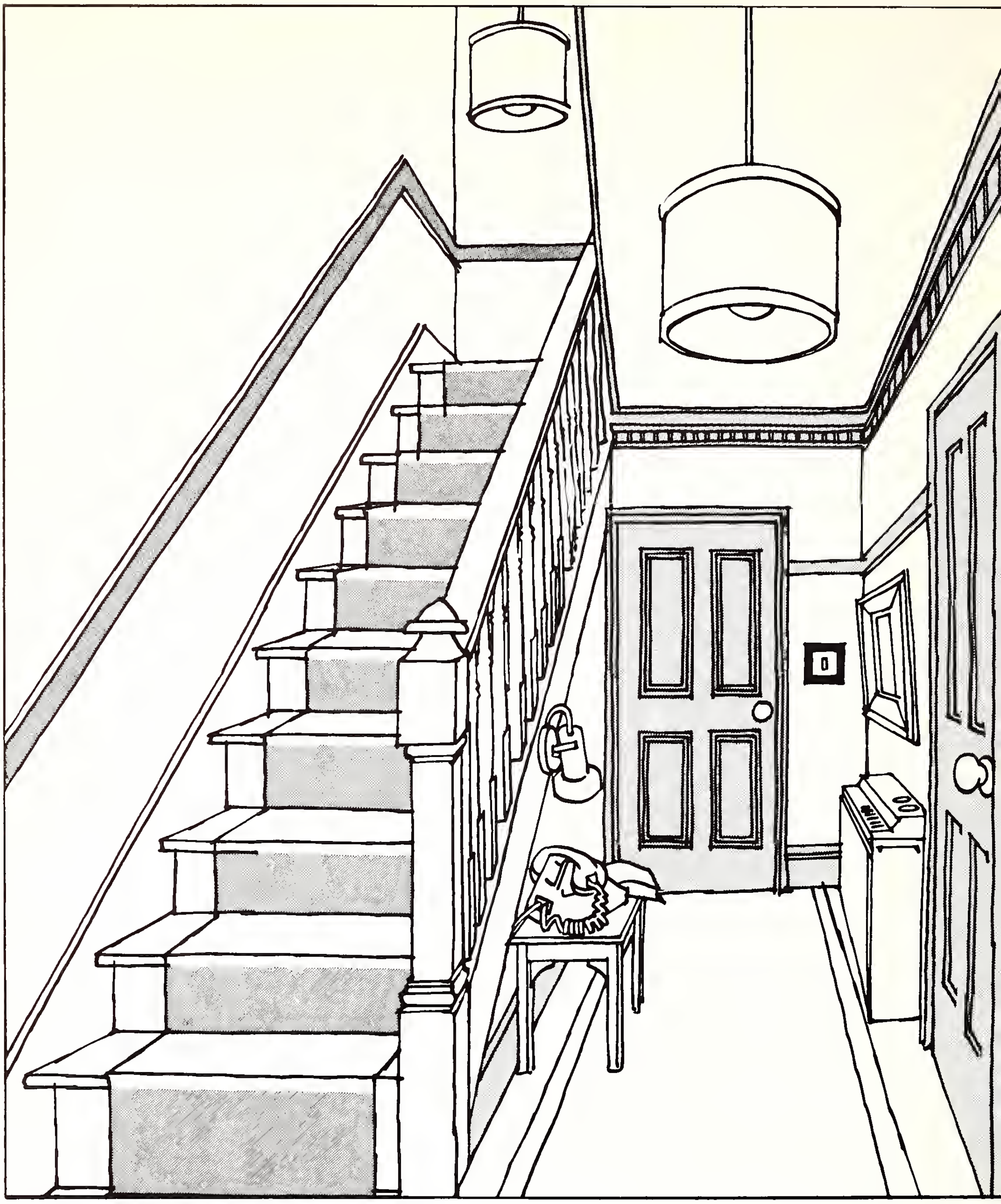
NOVEMBER 1980

A PARTIALLY SIGHTED SOCIETY PUBLICATION

Stairs



Looking back towards the stairs, the stair-carpet should be plain so that the pattern does not confuse and the stairs should be lit from both top and bottom so that obstructio can be seen. Switching from top and bottom of the stairs i essential.

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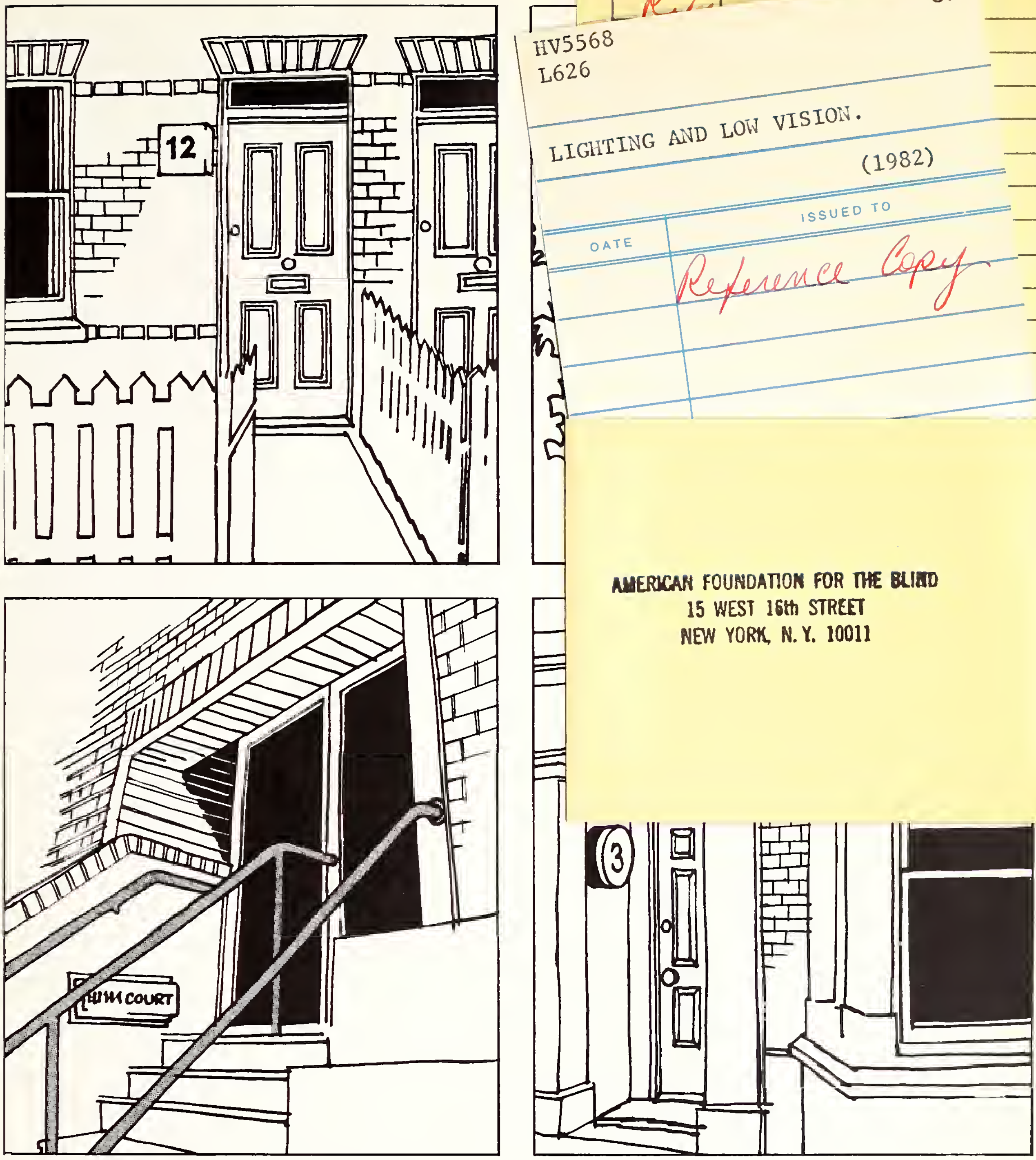

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There are many ways of lighting entrances but essentially the light should enable visitors to be seen from inside and also light the keyhole so that it can be easily found.

Steps, or any change in level, should be well lighted and white paint on the noses of treads may be helpful.

Additional information

Partially Sighted Society
Midlands Office
Breaston
Derby DE7 3UE
Tel: Draycott 3036 (24 hr.)

Free leaflets (send a large SAE)

Can we help you?
Partial sight

Technical information –

Light for low vision handbook:
price £6 (book or cassette tapes)

Optical Information Council
Walter House
418-422 Strand
London WC2R 0PB
Tel: 01-836 2323

Free leaflets (send a large SAE)

So you're partially sighted…
Eyecare after cataract

Prepared jointly by
The Electricity Council 30 Millbank, London SW1P 4RD.
and the Partially Sighted Society.

The Electricity Counc